

CHAPTER 10

EMERGENCY POSITION-INDICATING RADIO BEACON

10-1. **GENERAL.** This chapter covers the operation of SATFIND-406 M3 EPIRB. The beacon is an item of survival equipment. Vessels at sea carry the beacon onboard so it is readily available in any emergency. This chapter describes the following types of beacons:

- Class A.
- Class C.
- Category 1 (406).

a. **Class A EPIRB.** US Army vessels have commercially manufactured Coast Guard approved EPIRBs which meet the requirements of Title 46, Code of Federal Regulations, Subpart 161.011. Class A EPIRBs transmit on VHF 121.5 MHz and UHF 243.0 MHz simultaneously and have a line-of-sight range. These EPIRBs may be detected by SARSAT and by aircraft flying overhead. This international project uses satellites to detect and determine the position of EPIRBs.

(1) **Equipment description.** The class A EPIRB is a floatable, battery operated unit. The beacon case is orange with mounting bracket. The unit consists of a flexible antenna, transiting indicator light, waterproof test switch (push button), bridle, spacer rings, and bottom cap (removable for battery replacement).

(2) **Operation.** Store the beacon in its special bracket (with antenna pointed down) and ensure that it is free of obstructions. This will also ensure that it will automatically float off and activate if the vessel sinks. The person responsible for manually removing the beacon and attaching to personnel or survival craft with the provided lanyard will be designated on the station bill. When the unit is turned "ON" (by removal from the bracket and inverted) it transmits tone modulation signals (UHF/VHF). Rescue aircraft or vessels equipped with suitable direction finding equipment can "home" to the transmitting unit. Another means of detection is by SARSAT.

(3) **Inspection and maintenance.** Inspect the EPIRB every 30 days by completing the following steps:

- Rinse the outside of the unit with fresh water to remove any salt buildup on case or exposed parts.
- Check the antenna tip and spring for any signs of damage and corrosion.
- Check the antenna vinyl tube covering for any signs of chafing, wear, cracks, or other damage. Also check for signs of corrosion beneath the tubing.
- Check the antenna socket at the cap surface for any sign of looseness or corrosion.
- Check the beacon housing for any signs of damage or mishandling. Visible external damage may result in an equipment malfunction during an emergency.
- Check the nylon lanyard for chafing, fraying, or any damage. Check the lanyard and bridle for tightness. Resecure the lanyard only to the anchor point and make sure it is tight.

- Spray silicone lubricant on push button switch shaft.
- Check bracket area for hidden hazards that may foul, entangle, or prevent the beacon from being removed or floating off in case of an emergency.

(4) **Operational testing.** With the beacon in the bracket, press the “TEST” switch and hold. Remove the beacon from the bracket and turn it upright while holding the “TEST” switch.

NOTE

Conduct testing ONLY during the first 5-minute period of the hour and ONLY for three sweeps of the audio modulating tone or 1 second, whichever is longer. If the indicator does not light, hold the "TEST" switch for additional time. It takes 10 to 30 seconds for the beacon to reach full power. If the indicator remains unlit, replace the battery.

(5) **Battery replacement.** Class A EPIRB batteries have a service life of 36 months from date of manufacture. Do not extend the battery service life beyond the date shown on the battery label. The following are recommend steps on how to replace the class A EPIRB battery.

NOTE

You must lay the unit on a horizontal surface when replacing the battery. Removing the bottom cap while holding the unit right side up may cause the battery to fall out and therefore damage the wire leads. An angle greater than 90 degrees will turn “ON” the unit due to the gravity switch.

- Lay the EPIRB horizontally on a table and remove the bottom cap by turning it counterclockwise.
- Remove the foam spacer and battery by pulling on the nylon cord attached to the battery. CAUTION: Do not pull apart by the wire leads. Do not short circuit internally fused battery.
- Gently disconnect the colored wire leads by pulling at the connector.
- Reconnect the fresh battery, check for polarity, and insert battery. Fold lead wires alongside of the battery as you insert the battery.
- Examine gasket seal carefully to check that there are no foreign deposits to interfere with making a good seal.
- Replace foam spacer and weighted bottom cap. Apply silicon grease around cap screws and O-ring (NSN 6850-00-880-7616). Tighten cap firmly to ensure watertight seal.
- Examine bottom cap end and be sure you screw it in far enough to seal the gasket properly.
- Test the EPIRB using previous instructions given.

(6) **Disposal of battery.** Dispose of the battery IAW HAZMAT/Environmental SOP.

b. **Class C EPIRB.** Some US Army watercraft have class C EPIRBs installed. The units are commercially manufactured, FCC type accepted. Class C EPIRBs transmit on maritime VHF channels 15 and 16 and have a line of sight range.

(1) **Configuration.** The class C EPIRB is a floatable, battery operated unit. The beacon case, with its external antenna, is waterproof. The top of the beacon usually has an ON/OFF switch, strobe light, and red LED operation indicator.

(2) **Inspection.** Remove the beacon from its mounting bracket. Unscrew the antenna cap and fully extend the antenna. When depressing the small locking button next to the switch and rotating the switch to the “ON” position, a flashing red light indicates proper transmitter operation. The strobe may operate depending on ambient conditions.

(3) **Inspection and maintenance.** Inspect the EPIRB every 60 days by completing the following steps:

- Rinse the outside of the unit with fresh water to remove any salt buildup on case or exposed parts.
- Extend the antenna and check for signs of corrosion or damage. Spray the antenna with silicone lubricant and wipe clean.
- Check the beacon housing for signs of damage or mishandling. Visible external damage may result in an equipment malfunction during an emergency.
- Spray silicone lubricant on rotary switch shaft.

(4) **Operational testing.** Test every 60 days. Conduct testing ONLY during the first 5-minute period of the hour and for not more than 5 seconds. Complete the following steps to test:

- Unscrew antenna cap and extend antenna fully (37 inches).
- Depress small locking button next to switch and rotate switch to “ON”.
- If the EPIRB is operating properly, the red lamp and the strobe light will flash simultaneously in 1.5 seconds. This is the self test for the lamps. The lamps will continue to flash every second. Shade the red LED lamp in bright sunlight because the lamp may not be bright enough to see. The strobe will stop flashing when used either in below freezing temperatures or during daylight hours. This conserves battery power to the transmitter.
- Tune the VHF-FM radio to either channel 15 or 16. The EPIRB will transmit on channel 16 for 1.5 seconds and then automatically switch to channel 15 for 14.5 seconds.
- Turn the EPIRB “OFF”. Should the EPIRB FAIL the testing, replace the battery.

(5) **Battery replacement.** Replace class B EPIRB batteries every 6 months or after 30 minutes of accumulated use. Install only fresh name-brand alkaline batteries. DO NOT extend the battery service life beyond the date shown on the battery label. To replace the battery perform the following steps:

- Be sure the EPIRB is "OFF". Then turn it upside down and remove the cap by turning it counterclockwise. If the cap will not turn with the bare hand, use a cloth or bottle cap remover.

- Slide the battery holder out slowly by rotating unit upright.
- Coat each contact surface of cells and cap threads with a thin coating of silicon grease (NSN 6859-00-880-7616).

- Install eight fresh alkaline "C" cells, checking for correct polarity. Slide battery pack into tube.

- Inspect gasket for tears, cracks, and rips.
- Replace end cap.
- Rotate cap clockwise until just sealed, then tighten two turns further. Cap must be tight to obtain watertight seal.

- Test the EPIRB using the previous mentioned instructions.

(6) **Disposal of battery.** Dispose of the battery IAW HAZMAT/Environmental SOP.

c. **Category 1,406 EPIRB.** US Army watercraft have commercially manufactured EPIRBs. Category 1,406 EPIRBs (see Figure 10-1, page 10-6) transmit on 406.025 MHz and VHF 121.5 MHz simultaneously and have a line of sight range. SARSAT or COSPAS emergency surveillance systems may detect these EPIRBs. This international project uses satellites to detect and determine position of EPIRBs.

(1) **Description of category.** The 406 EPIRB is an automatic, float-free, battery-operated unit. The beacon case with its antenna, is waterproof. The unit has a "TEST" switch and a xenon strobe homing light installed on top.

(2) **Operation.** Store the beacon in its special bracket and free of obstructions. This will ensure that it will automatically float off and activate if the vessel sinks. The person responsible for manually removing the beacon and attaching to personnel or survival craft with the provided lanyard will be designated on the station bill. When set to "ARMED", the beacon starts transmitting when removed from the bracket (see Figure 10-2, page 10-6). It transmits tone modulated signals (VHF 121.5 MHz) so rescue aircraft or vessels equipped with suitable direction finding receiving equipment can "home" to the transmitting unit. Other means of detection are by COSPAS or SARSAT satellites.

NOTE

Use CAUTION when handling the beacon to prevent inadvertent transmission of emergency signals. Unit may not properly transmit after activation unless it is at least 1 meter away from metal surface.

(3) **Inspection and maintenance.** Inspect the EPIRB every 30 days by completing the following steps:

- Rinse the outside of the unit with fresh water to remove any salt buildup on case or exposed parts.
- Check the beacon housing for signs of damage or mishandling. Visible external damage may result in an equipment malfunction during an emergency.
- Check bracket for security and expiration date of hydrostatic release. Also check bracket area for hidden hazards that may foul, entangle, or prevent the beacon from being removed or floating off during an emergency.

(4) **Operational testing.** To ensure that the EPIRB is operational, perform the following steps:

NOTE

Make sure the ring is in the "OFF" position before removing the beacon from the bracket. Failure to do so will result in transmission of emergency signals. If the beacon fails to test, return the beacon to an authorized dealer. The beacon has no user-serviceable parts. An authorized dealer must perform all service operations.

- With the beacon in the bracket mount, rotate or press the "TEST" switch and hold.
 - The beacon light should flash within 4 seconds. If the beacon light does not flash within 4 seconds, the ship's structure may have caused interference from radiation. Remove the unit from bracket before testing.
 - Make sure the ring/switch is in the "OFF" position. Disconnect the yellow strap latch from the strap by pulling the strap towards you. Remove the beacon by carefully lifting the unit from the bracket.
 - Move the beacon at least 1 meter from the ship's structure. Rotate or press the "TEST" switch and hold. The beacon light should flash within 4 seconds. Turn the beacon to the "OFF" position after testing.
 - Replace the beacon in the bracket by replacing the bottom of the unit in first. Then push the top of the unit into place. Make sure the beacon is properly seated in the bracket. To properly seat the beacon, you must position the notch on the back into the mount correctly.
 - Replace the end of the strap in the bail of the latch. Push the latch back into the closed position.
 - Rotate the ring/switch to the "ARMED" position.

NOTE

Ensure the ring/switch is in the "ARMED" position after putting the beacon in the bracket. Failure to do so will prevent the beacon from transmitting when deployed.

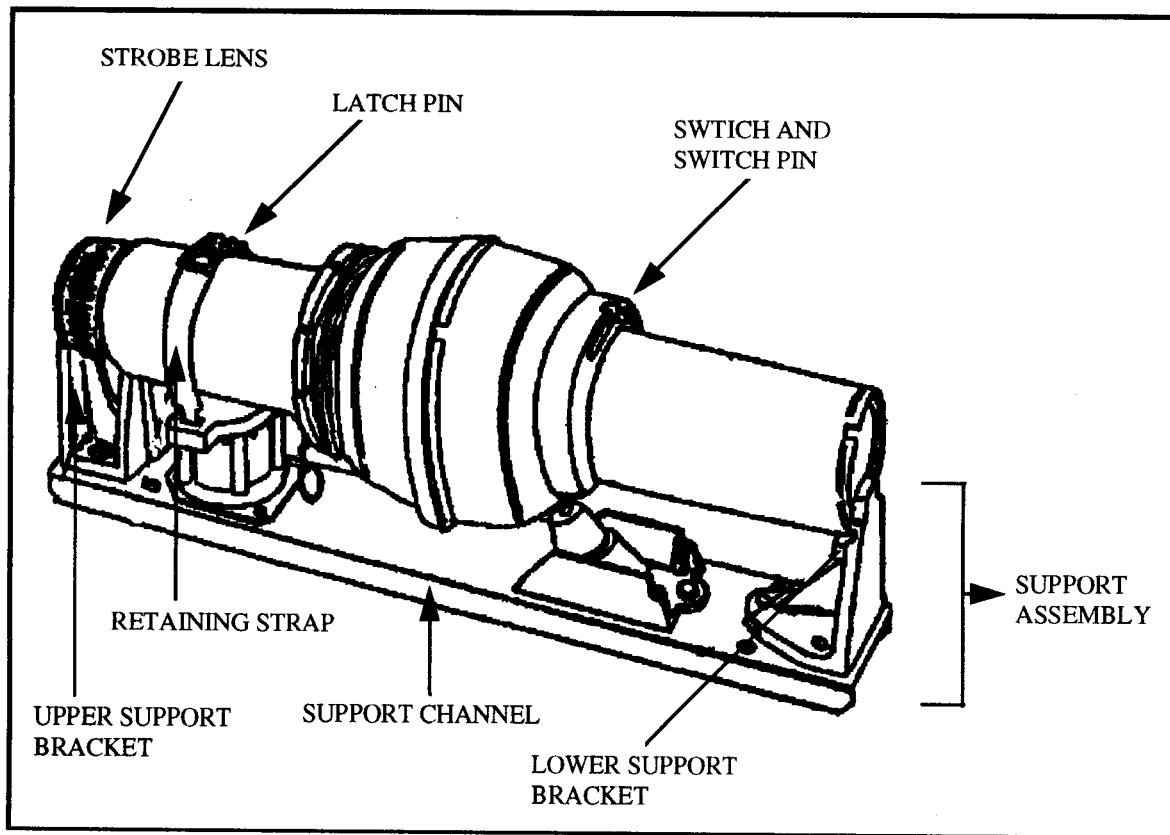


Figure 10-1. Category 1 (406) EPIRB

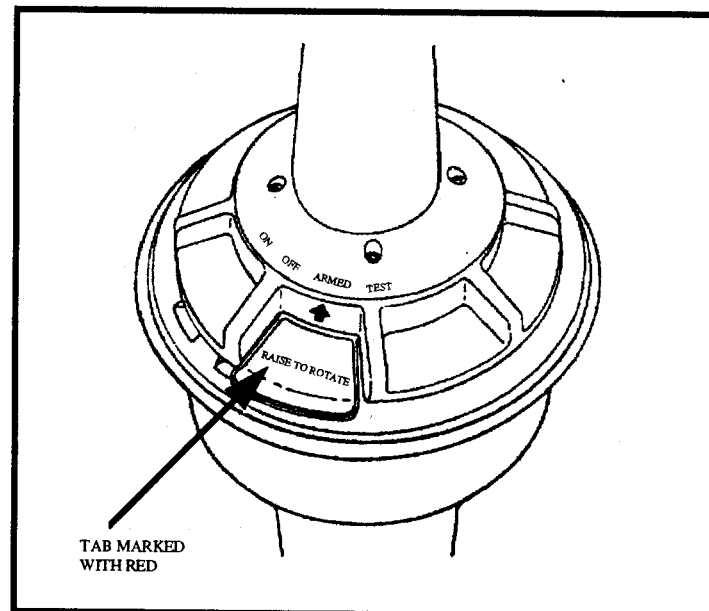


Figure 10-2. 406 EPIRB in armed position

(5) **Hydrostatic release mechanism.** This water pressure activated device, releases the beacon from its bracket when it reaches a depth of 1.5 to 4 meters. The hydrostatic release mechanism expires 2 years from the month of installation onboard. The crew will replace the hydrostatic release mechanism by following the manufacturer's instructions.

(6) **Battery replacement.** Category 1,406 beacons have a shelf life or service life of 5 years from date of manufacture. If the battery is out of date, disarm and remove the beacon from the bracket. Return it to an authorized dealer for battery replacement. Do not extend battery service life beyond date shown on the battery label.

10-2. REGISTRATION OF EPIRB. The code programmed into the EPIRB and imprinted on the registration card will not be changed during the life of the unit. Fill out the registration card and send it to the following address:

NOAA/USMCC
CHIEF USMCC
SEARCH AND RESCUE SATELLITE
OPERATION DIVISION
CODE E/SP
FEDERAL BUILDING
WASHINGTON, D.C. 20233

10-3. PROOF OF REGISTRATION. Annually, an updated "Proof of Registration" decal must be attached to the outer case of the EPIRB. The decal contains the coded signal for your EPIRB, vessel name, and one year expiration date. Make sure the coded signal matches the EPIRB's signal code. Each year, NOAA will send a form to the office controlling the EPIRB registration. This form must be completed and returned to:

NOAA (NOAA/NESDIS)
SARSAT OPERATIONS DIVISION
CODE E/SP3
FEDERAL BUILDING 4
WASHINGTON, D.C. 20233
TELEPHONE: (301) 457-5678

They, in turn, will send an updated "Proof of Registration" decal to be attached to the EPIRB.

10-4. PROCUREMENT. Order the Category 1 (406) EPIRB by NSN 6320-01-378-0221.